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 (12) **Patent Application Publication**  
 Holt et al.  
 Pub. No.: US 2004/0051517 A1  
 Pub. Date: Mar. 18, 2004

(54) **COUNTER BALANCED VERTICAL DOCKING MOTION IN A DRIVEN VERTICAL AXIS TEST HEAD MANIPULATOR**

(75) Inventors: Alyn R. Holt, Cherry Hill, NJ (US);  
 Brian R. Moore, Cornwall (GB);  
 Henri M. Akouka, Moorestown, NJ (US)

Correspondence Address:  
 Lawrence E. Athery  
 RatnerPrestia  
 One Westlakes Berwyn Suite 301  
 PO Box 580  
 Valley Forge, PA 19482-0580 (US)

(21) Appl. No.: 10/204,069

(22) PCT Filed: Mar. 1, 2001

(86) PCT No.: PCT/US01/06456

#### Related U.S. Application Data

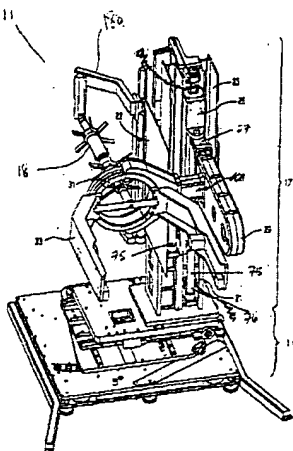
(60) Provisional Application No. 60/184,196, filed on Mar. 1, 2000.

#### Publication Classification

(51) Int. Cl. C41R 1/00  
 (52) U.S. Cl. 324/158.1

#### ABSTRACT

A positioner, such as a test head carrier for a semiconductor wafer and device tester, includes a vertical support and a main arm for supporting a test head. The main arm is suspended for vertical movement by use of a counterbalancing force such as counterweights. The suspension of the main arm is performed at a mechanical advantage so that reduced counterbalancing force and correspondingly large movements on the counterbalance side are used to effect the vertical movement. The vertical support may be actuated with a non-compliant drive such as a ball screw mechanism. The vertical movements can also be used to sense collisions and other positioning errors and sensation of the drive for the vertical support can be controlled accordingly.



INVEST. AS.

PGPUB-DOCUMENT- 20040051517

NUMBER:

PGPUB-FILING- new

TYPE:

DOCUMENT- US 20040051517 A1

IDENTIFIER:

TITLE: Counter balanced vertical docking motion in a driven vertical axis test head manipulator

PUBLICATION-DATE: March 18, 2004

#### INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Holt, Alyn R.	Cherry Hill	NJ	US
Moore, Brian R.	Cornwall	NJ	GB
Akouka, Henri M.	Moorestown		US

US-CL-CURRENT: 324/158.1

#### CLAIMS:

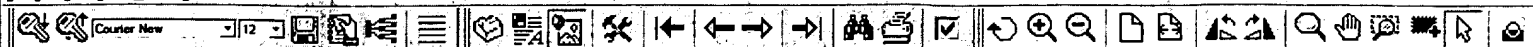
What is claimed:

1. Apparatus for supporting a load, said apparatus comprising: a drive mechanism for effecting a first positional adjustment of said load; and a coupling mechanism for coupling said drive mechanism to said load, said coupling mechanism effecting a second positional adjustment of said load, said coupling mechanism having a mechanical advantage greater than one.
2. The apparatus of claim 1 wherein said load is a test head.
3. The apparatus of claim 1 wherein said drive mechanism includes a non-compliant linear actuator that drives said load in a vertical direction.
4. The apparatus of claim 3 wherein said linear actuator includes a braking mechanism.
5. The apparatus of claim 3 wherein said linear actuator includes at least one of a thread pitch or an internal friction sufficient to prevent back driving of said load.
6. The apparatus of claim 1 additionally comprising a primary support

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PCT/US02/22193  
 pub 01/30/2003



US 20040227534A1

(19) United States  
(12) Patent Application Publication (10) Pub. No.: US 2004/0227534 A1  
Mueller (43) Pub. Date: Nov. 18, 2004

(54) TEST HEAD POSITIONING SYSTEM AND METHOD

Publication Classification

(70) Inventor: Christian Mueller, Rosenheim (DE)

(51) Int. Cl. G01R 31/00; F16M 13/00  
(52) U.S. Cl. 324/759; 324/763; 73/866.5; 248/651

Correspondence Address:  
RAYPRESTIA  
P.O. BOX 880  
VALLEY FORGE, PA 19443-0880 (US)

(57) ABSTRACT

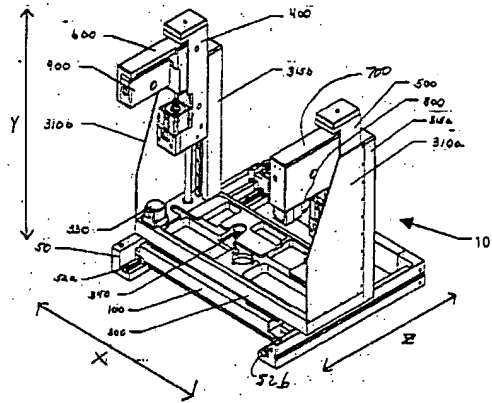
(21) Appl. No.: 10/813,362

An apparatus for supporting a load includes pneumatic units and couplers coupled to opposite sides of the load. The couplers move the load parallel to a first axis responsive to actuation of the pneumatic units. At least one of the couplers rotates the load about a second axis orthogonal to the first axis. The load is compliant along the first axis and about the second axis. At least one of the pneumatic units provides compliance along the first axis and about the second axis.

(22) Filed: Mar. 30, 2004

Related U.S. Application Data

(60) Provisional application No. 60/459,019, filed on Mar. 31, 2003.



INT. TEST. AS.

PGPUB-DOCUMENT-NUMBER: 20040227534

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040227534 A1

TITLE: Test head positioning system and method

PUBLICATION-DATE: November 18, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Mueller, Christian	Rosenheim	N/A	DE

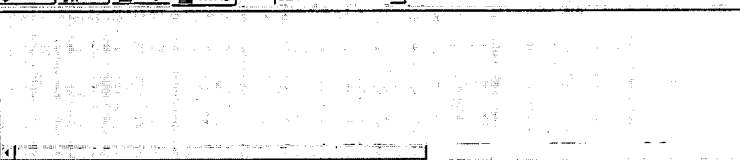
US-CL-CURRENT: 324/759, 248/651, 324/763, 73/866.5

CLAIMS:

What is claimed:

1. Apparatus for supporting a load, comprising: a plurality of pneumatic units; a plurality of couplers coupled to opposite sides of said load, said couplers moving said load parallel to a first axis responsive to actuation of said plurality of pneumatic units, at least one of said couplers rotating said load about a second axis orthogonal to said first axis, said load compliant along said first axis and about said second axis, at least one of said pneumatic units provides compliance along said first axis and about said second axis.
2. Apparatus for supporting a load according to claim 1, further comprising a swing plate for moving said load about said first axis.
3. Apparatus for supporting a load according to claim 1, wherein when said load moves about said second axis, said one of said couplers moves in one direction while either: a) another of said couplers moves in an opposite direction; or b) said another of said couplers remains stationary.
4. Apparatus for supporting a load according to claim 1, further comprising an in-out plate, for moving said load parallel to said second axis.
5. Apparatus for supporting a load according to claim 1, further

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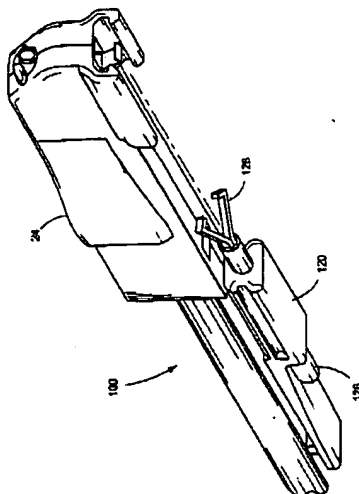
Details Text Image HTML

**U.S. Patent**

Dec. 7, 2004

Sheet 5 of 9

**US 6,828,769 B2**



**FIG. 5**

US-PAT-NO: 6828769  
DOCUMENT- US 6828769 B2  
IDENTIFIER:

\*\*\*See image for Certificate of Correction\*\*\*

**TITLE:** Cartridge system for a probing head for an electrical test probe

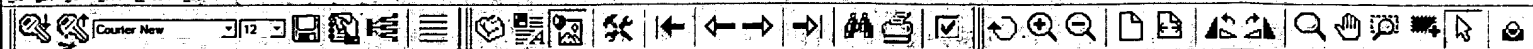
Assistant Examiner - XA (1):

Patel; Parosh

Detailed Description Text - DETX (9):

FIGS. 5-9 show various embodiments of an integrated grabber 100. FIGS. 5-7 show an integrated grabber cartridge system in which the main probing head body 24 is substantially similar to that shown in FIGS. 1-4. The cartridge, however, is an integrated grabber cartridge 120. The actuator 126 and grabber tip 128 are exposed from the integrated grabber cartridge 120 at opposite ends so that by pushing and pulling the actuator 126 the grabber tip 128 opens and closes. It should be noted that alternate actuating means are possible (for example, a side actuator). FIGS. 8 and 9 shows an alternate embodiment of the integrated grabber in which the grabber is integrated into a cartridge that can be attached to a probing head body.

Details Text Image HTML KWIC							
8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 6522156 B2	20030218	30	planar subassembly for testing IC chips having	324/
9	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 6504378 B1	20030107	14	Apparatus for evaluating contact pin integrity of	324/



US 20070013405A1

(15) United States

(12) Patent Application Publication

(10) Pub. No.: US 2007/0013405 A1

Gudin et al.

(43) Pub. Date:

Jan. 18, 2007

(34) TEST HEAD DOCKING SYSTEM AND METHOD

Related U.S. Applications Data

(62) Division of application No. 10/484,014, filed on Jul. 7, 2004, now Pat. No. 7,109,733, filed as 371 of International application No. PCT/US02/22153, filed on Jul. 12, 2002.

(60) Provisional application No. 60/305,633, filed on Jul. 15, 2001.

Publication Classification

(51) Int. Cl.

G01B 31/06

(2006.01)

(52) U.S. Cl.

334765

ABSTRACT

A system for docking an electronic test head with a handling apparatus is provided. The system includes an assembly for at least partially aligning and subsequently bringing together the electronic test head and the handling apparatus. The system also includes a power driven actuator for providing only partially powered assistance in bringing together the electronic test head and the handling apparatus.

Correspondence Address:

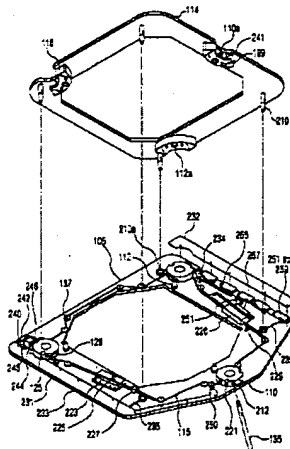
RAJNESH PRESTIA

P.O. BOX 982

VALLEY FORGE, PA 19462-0982 (US)

(21) Appl. No.: 11/593,326

(22) Filed: Aug. 11, 2004



handling apparatus towards each other; and actuating said at least one power driven actuator for providing at least partially powered assistance to bring said test head and said handling apparatus towards each other.

3. A method of docking a test head with a handling apparatus comprising the steps of: detecting entry of at least one alignment feature into a respective alignment feature receptacle, said alignment feature being situated on one of said test head and said handling apparatus, said alignment feature receptacle being situated on the other of said test head and said handling apparatus; detecting a position of at least one of a plurality of cams, said position being at least one of, (a) a first position where at least one of said cams, located on one of said test head and said handling apparatus, is ready to receive a respective cam follower, located on the other of said test head and said handling apparatus, (b) a docked position where said test head and said handling apparatus are docked together, and (c) a position between said first position and said docked position; and actuating at least one power driven actuator for providing at least partially powered assistance to bring said test head and said handling apparatus towards each other.

4. A method of docking a test head with a handling apparatus comprising the steps of: detecting entry of at least one alignment feature into a respective alignment feature receptacle, said alignment feature being situated on one of said test head and said handling apparatus, said alignment feature receptacle being situated on the other of said test head and said handling apparatus; sensing that said test head and said handling apparatus are positioned relative to one another such that at least one power driven actuator is operable to bring said test head and said handling apparatus towards each other; initializing, by an operator, manual actuation of an assembly for bringing said test head and said handling apparatus towards each other; and actuating said at least one power driven actuator for providing partially powered assistance to bring said test head and said handling apparatus towards each other.

5. The method of claim 4 wherein said step of initializing includes operating a handle, said handle initializing operation of said assembly.

6. The method of claim 4 additionally comprising the step of: latching said test head to said handling apparatus.

7. The method of claim 4 additionally comprising the step of: interrupting either of said steps of initializing or actuating upon the operator detecting at least one of (a) misalignment between said test head and said handling apparatus, and (b) an obstruction being present between said test head and said handling apparatus.

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☐ Match case

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\* only method claims

Fol 10/413362

(13) United States  
(12) Patent Application Publication (10) Pub. No.: US 2002/0178982 A1  
Kobayashi (43) Pub. Date: Dec. 5, 2002

(54) SEWING MACHINE HAVING BALANCE  
(75) Inventor: Hajime Kobayashi, Osaka (JP)

Correspondence Address:  
ARMSTRONG, WESTERMAN & HATTORI,  
LLP  
1725 K STREET, NW.  
SUITE 1000  
WASHINGTON, DC 20006 (US)

(73) Assignee: Jaguar International Corporation,  
Mitsubishi (JP)

(21) Appl. No.: 09/988,182

(22) Filed: Nov. 18, 2001

(30) Foreign Application Priority Data

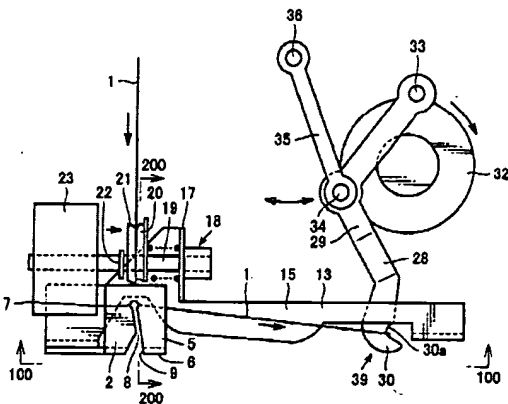
May 31, 2001 (JP) JP2001-163699

Publication Classification

(51) Int. Cl. D05B 51/00

(52) U.S. Cl. 112.278  
(57) ABSTRACT

A sewing machine capable of preventing formation of no first stitch (skipping stitch) which is readily caused immediately after the sewing machine starts to operate, is obtained. This sewing machine comprises a first detector detecting that a thread engaging part of a balance is located in the vicinity of a forward movement starting point (located beyond a thread receiving opening of a thread guide plate and an indicator operating on the basis of a detection signal received from the first detector. Thus, the operator can recognize that the thread engaging part of the balance is located in the vicinity of the forward movement starting point (located beyond the thread guide plate through the indicator. When the operator moves the balance to a position for turning on the indicator, guides a needle thread and thereafter operates the sewing machine, therefore, the thread engaging part of the balance reliably captures and pulls the needle thread also immediately after the sewing machine starts to operate. Consequently, formation of no first stitch (skipping stitch), which is readily caused immediately after the sewing machine starts to operate, is prevented.



DOCUMENT-IDENTIFIER: US 20020178982 A1  
TITLE: Sewing machine having balance

Summary of Invention Paragraph - BSTX (12):

{0010} A sewing machine according to an aspect of the present invention comprises a thread guide plate having a thread receiving opening, a balance having a thread engaging part and reciprocating through the thread guide plate so that the thread engaging part captures and pulls a needle thread when forwardly moving from left to right, a first detector detecting that the thread engaging part of the balance is located in the vicinity of a forward movement starting point (located beyond the thread receiving opening of the thread guide plate and an indicator operating on the basis of a detection signal received from the first detector.

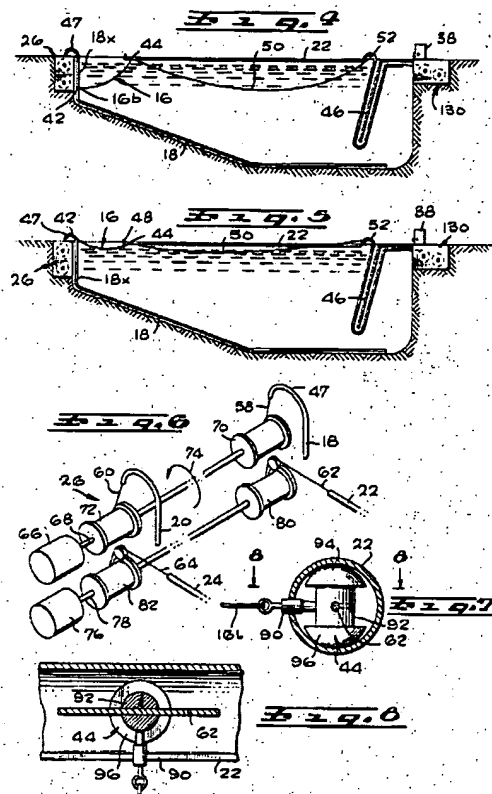
Details	Text	Image	HTML	KWIC
14	US 5912563 A	19990615	10	locking-in a YIG-tuned
15	US 5337335 A	19940809	10	Trinary signal apparatus and 326/ method
16	US 3840118 A	19741008	8	Phase locked loop with 375/ frequency deviation detector
17	JP. 61243988 A	19861030	11	SWIMMING POOL SWEEPING 210/ SYSTEM
				CLOCK EXTRACTING CIRCUIT

feature - thread  
reciprocating - plate  
Moveable feature - part  
detector -

PATENTED OCT 8 1974

3,840,118

SHEET 2 OF 4



US-PAT-NO: 3840118  
DOCUMENT-IDENTIFIER: US 3840118 A  
TITLE: SWIMMING POOL SWEEPING SYSTEM

Brief Summary Text - BSTX (5):

In accordance with one embodiment of the present invention, a pool sweeping system is provided which can rescue a child who makes an unauthorized entry into the pool. This system includes a net that extends across the width of the pool and which extends from the bottom to the top of the pool. When the system is activated and an unauthorized entry is detected, the net is swept from the deep end of the pool to the shallow end, and is raised to the top of the water to capture and pull out any large object in the pool, such as a child. The net is pulled by four cables that run along four rails, including two bottom rails that extend along opposite sides of the pool at the bottom, and two upper rails that extend along opposite sides of the pool at the top. A winch at the shallow end of the pool pulls all four cables to pull the net across the pool. At the shallow end of the pool, the lower rails extend upwardly to the top of the pool, so that after the net has swept the pool, it lifts any object to the top of the water. The sweeping mechanism can be utilized to carry vacuum heads along the bottom of the pool to clean it, such a cleaning operation also being useful to provide a periodic check of operation of the rescuing apparatus.

Details	Text	Image	HTML	KWIC
16	<input type="checkbox"/>	<input type="checkbox"/>	US 3840118 A	19741008 8 frequency deviation detector
17	<input type="checkbox"/>	<input type="checkbox"/>	JP 61243988 A	19861030 11 SWIMMING POOL SWEEPING SYSTEM
18	<input type="checkbox"/>	<input type="checkbox"/>	US 20020178982 A	20021205 9 CLOCK EXTRACTING CIRCUIT
	<input type="checkbox"/>	<input type="checkbox"/>		9 Sewing machine comprises location detector for thread



FIG. 6

FIG. 7

Claims Text - CLTX (30):

Claims Text - CLTX (31):

Claims Text - CLTX (33):

Claims Text - CLTX (35):

Claims Text - CLTX (37):

Claims Text - CLTX (39) :

Claims Text - CLTX (41) :

the slide lock plate is slidably carried on the valve housing.

Details Text Image HTML KWIC			
29	<input type="checkbox"/>	<input type="checkbox"/>	US 4597352 A 19860701 61 arrangement Compact towing system for underwater bodies 114/
30	<input type="checkbox"/>	<input type="checkbox"/>	US 4538383 A 19850903 14 Front surface grinding machine and method 451/
31	<input type="checkbox"/>	<input type="checkbox"/>	US 4373690 A 19830215 13 Deployable support structure for spacecrafts 244/
32	<input type="checkbox"/>	<input type="checkbox"/>	US 4319668 A 19820316 8 Push-pull caliber 188/

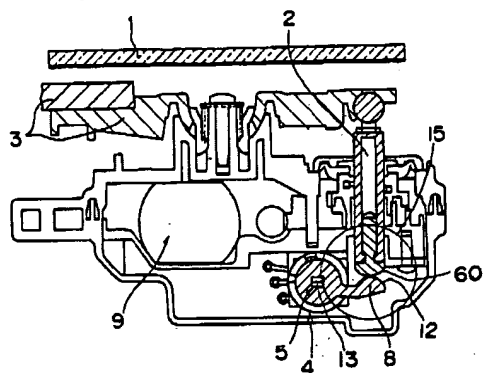
U.S. Patent

Dec. 14, 1999

Sheet 2 of 5

6,000,805

Fig. 2



US-PAT-NO:

6000805

DOCUMENT-IDENTIFIER: US 6000805 A

TITLE:

Mirror assembly for automobile

## Brief Summary Text - BSTX (8):

In FIG. 2, which illustrates the one embodiment of the present invention, a reference numeral 1 denotes a mirror; 3 denotes a mirror holder for holding the mirror 1 from the rear side thereof; 2 denotes a mirror push-pull operation shaft one end of which is connected to the mirror holder 3 and the other end of which has a rear end face 60; 5 denotes a rotary variable resistor for detecting an angular change of the mirror 1 as a change of value of resistance thereof; 8 denotes an actuator that is fixed to the rotary variable resistor 5 and that has a contact face 12 forming on the side of the rear end face 60 of the mirror push-pull operation shaft 2; 9 denotes a drive unit for moving the mirror push-pull operation shaft 2 in its axial direction; and 4 denotes a mirror position detector (mirror posture detector) that includes both the rotary variable resistor 5 and the actuator 8. All these parts and members are accommodated in an unshown visor.

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